REMARKS

This Amendment is submitted in response to the Examiner's Action mailed May 14, 2004, with a shortened statutory period of three months set to expire August 14, 2004. With this amendment, claims 1, 3-4, 6, 8-9, 11, 13-14, and 16 have been amended.

Applicants have amended the specification to correct typographical errors. A proposed drawing change has been filed herewith to correct typographical errors in block 413 of Figure in order to make the figure consistent with the description of the figure in the specification. The corresponding description of block 413 of Figure 4 has been amended so that the text and figure are consistent. No new matter has been added.

The Examiner objected to claims 4, 9, and 14 because of informalities. These claims have been amended to correct these informalities.

Applicants have amended the claims to describe configuring SMP systems and assigning a NUMA identification occurring prior to beginning booting of any of the SMP systems. Each one of the SMP systems is configured to operating within a NUMA system prior to beginning booting of any of the SMP systems. Also prior to beginning booting of any of the SMP systems, a NUMA identification is assigned to each one of the SMP systems where each identification is unique. All of the SMP systems are then concurrently booted together in NUMA mode in one pass. Memory coherency is established prior to the execution by any of the SMP systems of system firmware.

Dependent claims describe all of the processors within each one of the SMP systems competing to become a nodal master processor. This competition is described as taking place prior to beginning booting of any of the SMP systems. Within each SMP system, the processor that won the competition is designated as the nodal master processor while the remaining processors in the system are designated as slave processors.

Each one of these nodal master processors then compete to become a NUMA master processor. This competition also takes place prior to beginning booting of any of the SMP systems. The nodal master processor that won this competition is designated as the NUMA master processor while the remaining nodal master processors are designated as slave NUMA processors.

In addition to these features, claim 16 also describes the processors in each SMP system competing to become the master processors and one of the processors winning the competition by acquiring a nodal semaphore. Only one processor at a time can acquire and hold the nodal semaphore. The processor that acquires the nodal semaphore wins the competition and is designated as the nodal master processor. The remaining processors are then designated as slave processors.

Claim 16 also describes each nodal master processor competing to become the NUMA master processor and one of the nodal master processors winning the competition by acquiring a NUMA semaphore. Only one processor at a time can acquire and hold the NUMA semaphore. The nodal processor that acquires the NUMA semaphore wins the competition and is designated as the NUMA master processor. The remaining nodal master processors are then designated as slave NUMA processors.

The Examiner rejected claims 1, 3, 5, 6, 8, 10, 11, 13, and 15 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,938,765 issued to *Dove*. This rejection, as it might be applied to the claims as amended, is respectfully traversed.

Dove describes a two-part booting process. During the first part, the SMP systems complete a boot as if each system were in stand-alone mode. At this point each SMP system has begun and finished a boot process. Thereafter, an additional initialization routine is run that boots these systems for a multimode environment. The boot process taught by *Dove* is clearly described as having a first initialization process that is the standard BIOS boot process and then a second initialization process. See column 6, lines 18-20, column 3, lines 12-14, and column 3, lines 20-23.

Applicants' claims describe configuring the SMP systems and assigning a NUMA identification prior to beginning the booting of any of the SMP systems. *Dove* does not teach configuring and assigning an identifier prior to beginning booting. *Dove* teaches executing its processes after the completion of booting the SMP systems in stand-alone mode. Therefore, *Dove* does not anticipate Applicants' claims. Further, *Dove* teaches away from Applicants' claims because *Dove* teaches its processes occurring after the completion of booting in stand-alone mode. *Dove* does not teach its processes occurring prior to beginning booting of any of the nodes.

Applicants also claim all processors in each SMP system competing with each other to become a nodal master processor. The processor that wins this competition within each SMP system is designated as the nodal master processor. All remaining processors within that SMP system are designated as slave processors. The competition and designations occur prior to beginning booting of the SMP systems.

All nodal master processors then compete to become the NUMA master processor. The nodal master processor that won this competition is then designated as the NUMA master processor. All remaining nodal master processors are designated as slave NUMA processors. The competition and designations occur prior to beginning booting of the SMP systems.

Dove describes a boot strap processor (BSP) that is assigned in each node that is responsible for initializing its node by running the standard BIOS. Once the BIOS is complete on all of the nodes, a master processor is given the responsibility of loading the operating system for the entire system.

This master processor is chosen by one of three methods. The master processor can be predetermined. The master processor can be chosen by a user. Or, the master processor can be determined during or after initialization. *Dove* does not teach a master processor being chosen through a competition among all of the processors. *Dove* does not teach that a competition occurs prior to booting the SMP systems.

Dove describes the master processor creating a node-configuration table that includes a node identifier. This table is created during the initialization by BIOS. See column 7, lines 25-26. This table is not created prior to beginning booting of the node systems. Therefore, *Dove* does not teach assigning a NUMA identification to each SMP system prior to beginning booting of any of the SMP systems.

Applicants claim concurrently booting all of the SMP systems together in NUMA mode in one pass. *Dove* clearly teaches its boot process taking place in two passes. During the first pass each node is booted in stand-alone mode. During the second pass the nodes are booted in a multimode environment. Therefore, *Dove* does not teach booting the systems in NUMA mode in one pass.

Dove does not anticipate Applicants' claims. *Dove* does not describe, teach, or suggest the configuring of the SMP systems and assigning a NUMA identification prior

to beginning booting of the SMP systems. *Dove* teaches a two-part initialization boot process. The first part of the process causes the SMP systems to boot in stand-alone mode having completed the execution of their BIOS. Only after each system has finished booting in stand-alone mode does *Dove* describe teach booting the systems in a multimode environment.

Dove does not teach booting the separate nodes together in NUMA mode in one pass. *Dove* teaches a two part boot process.

Dove does not teach the processors of each node competing with each other to become the nodal master processor. *Dove* does not teach each nodal master processors competing with each other to become the NUMA master processor. *Dove* does not teach any such competition at all. Thus, *Dove* does not teach these competitions taking place prior to beginning any booting of the nodes.

The Examiner rejected claims 2, 7, 12, and 16 under 35 U.S.C. § 103(a) as being unpatentable over *Dove* in view of U.S. Patent 6,678,741 issued to *Northcutt*. This rejection, as it might be applied to the claims as amended, is respectfully traversed.

Applicants claim further features that are included in the configuration feature that is claimed as taking place prior to any booting of the SMP systems. The Examiner states that *Dove* does not teach a software locking mechanism that loads firmware and a receiving component that receives a confirmation that the firmware version is the same for all SMP systems. The Examiner uses *Northcutt* to add these missing features.

However, because neither *Dove* nor *Northcutt* singly describe, teach, or suggest configuring the SMP systems and assigning a NUMA identification prior to any booting of the SMP systems, or concurrently booting the SMP systems in NUMA mode in one pass, the combination does not describe, teach, or suggest the combination of configuring the SMP systems and assigning a NUMA identification prior to any booting of the SMP systems, or concurrently booting the SMP systems in NUMA mode in one pass in addition to the configuring including configuring and testing host processors and memory, configuring and testing NUMA memory, loading firmware image into local memory and informing a hardware system console of the firmware version, receiving a confirmation from the hardware system console that the firmware version is the same for all multiprocessing systems in the NUMA system, configuring NUMA adapters to

connect each multiprocessing system to the NUMA system and initializing all host processors, and releasing all host processors to execute system firmware.

With regard to claim 16 the Examiner states that *Dove* does not teach a software locking mechanism that loads firmware and a receiving component that receives a confirmation that the firmware version is the same for all SMP systems and uses *Northcutt* to add these missing features. For the reasons given above, the combination of *Dove* and *Northcutt* does not describe, teach, or suggest the features of claim 16.

In addition to the features described above, claim 16 also now describes the processor within each of the SMP systems winning the competition to become a nodal master processor by acquiring a nodal semaphore. All of the processors that became a nodal master processor then compete to become the NUMA master processor. A nodal master processor wins that competition by acquiring a NUMA semaphore. The nodal master processor that acquires the nodal semaphore becomes the NUMA master processor. All remaining nodal master processors that did not win the competition become NUMA slave processors.

The combination of references does not describe, teach, or suggest a processor in an SMP system becoming the nodal master processor by acquiring a semaphore and one of the nodal master processors becoming the NUMA master processor by acquiring a NUMA semaphore.

The Examiner rejected claims 4, 9, and 14 under 35 U.S.C. § 103(a) as being unpatentable over *Dove* in view of U.S. Patent 5,802,378 issued to *Arndt*. This rejection, as it might be applied to the claims as amended, is respectfully traversed.

Applicants claim performing handshaking between the nodal master processor that acquired the nodal semaphore and each nodal slave processor and switching the nodal slave processors to a hypervisor environment in which the nodal slave processors become NUMA slave processors. The combination of references does not describe, teach, or suggest the combination of the other features of these claims in addition to handshaking between the nodal master processor that acquired the nodal semaphore and each nodal slave processor and switching the nodal slave processors to a hypervisor environment in which the nodal slave processors become NUMA slave processors.

For the reasons given above, Applicants' claims are believed to be patentably distinct over the prior art. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,

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